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Claims as enclosed to IPER

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We claim:

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1. An integrated process for the synthesis of propylene oxide, which comprises at least the following steps:

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 - (a) dehydrogenation of propane to give a substream T (0) comprising at least propane, propene and hydrogen;
 - (b) fractionation of the substream T (0) to give at least one gaseous hydrogen-rich substream T (2) and a substream T (1) comprising at least propene and propane;
 - (c) fractionation of the substream T (1) to give at least one propane-rich substream T (5) and at least one propene-rich substream T (3);
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 - (d) separation of the substream T (5) into at least the substreams T (5a) and T (5b);
 - (e) synthesis of hydrogen peroxide using the substream T (2) which is combined with at least the substream T (5a), giving a substream T (4) which is rich in hydrogen peroxide and a gaseous substream T (6a);
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 - (f) at least partial recirculation of the substream T (6a) to step (a);
 - (g) reaction of the at least one substream T (3) with substream T (4) to give propylene oxide.
 - 25 2. The process as claimed in claim 1, wherein the propane-rich substream T (5b) is fed to step (a).
 3. The process as claimed in claim 1 or 2, wherein substream T (4) comprises at least hydrogen peroxide and water.
 - 30 4. The process as claimed in any of claims 1 to 3, wherein the reaction in step (g) is the epoxidation of the propene from substream T (3) by means of hydrogen peroxide from substream T (4) in the presence of a catalyst to give propylene oxide.
 - 35 5. The process as claimed in any of claims 1 to 4, wherein a substream T (7) comprising at least propane and/or propene is obtained from step (g) and is wholly or partly recirculated to step (a).

6. The process as claimed in any of claims 1 to 5, wherein a substream T (7) comprising at least propane and propene and having a ratio of propane to propene of less than 1 is obtained from step (g) and is, if appropriate after a further work-up step, wholly or partly recirculated to step (c).